

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

80. (Previously Presented) A cathodoluminescent device, comprising:

- a) an excitation source; and
- b) at least a first layer of cathodoluminescent phosphor particles selected from the group consisting of  $Y_2O_2S$ ,  $ZnS$ ,  $Zn_2SiO_4$ ,  $SrGa_2S_4$  and  $Y_2SiO_5$  that are adapted to be stimulated by said excitation source, wherein said phosphor particles have a weight average particle size of from about 0.1  $\mu m$  to about 10  $\mu m$ , a substantially spherical morphology and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

81. (Original) A cathodoluminescent device as recited in Claim 80, wherein said phosphor particles have a weight average particle size of from about 0.3  $\mu m$  to about 5  $\mu m$ .

82. (Original) A cathodoluminescent device as recited in Claim 80, wherein said excitation source has an excitation potential of not greater than about 5 kV.

83. (Original) A cathodoluminescent device as recited in Claim 80, wherein said excitation source has an excitation potential of at least about 5 kV.

84. (Original) A cathodoluminescent device as recited in Claim 80, wherein said excitation source has an excitation potential of at least about 20 kV.

85. (Cancelled)

86. (Original) A cathodoluminescent device as recited in Claim 80, wherein said phosphor particles comprise  $Y_2O_2S:Eu$ .

87. (Original) A cathodoluminescent device as recited in Claim 80, wherein said phosphor particles comprise  $ZnS$  and a dopant selected from the group consisting of Au, Al, Cu, Ag, Cl and combinations thereof.

88. (Original) A cathodoluminescent device as recited in Claim 80, wherein said

particles comprise  $Zn_2SiO_4$ :Mn.

89. (Cancelled)

90. (Original) A cathodoluminescent device as recited in Claim 80, wherein said particles comprise  $SrGa_2S_4$ , and a dopant selected from the group consisting of Eu and Ce.

91. (Original) A cathodoluminescent device as recited in Claim 80, wherein said particles comprise  $Y_2SiO_5$  and a dopant selected from the group consisting of Tb and Ce.

92. (Original) A cathodoluminescent device as recited in Claim 80, wherein said device is a field emission display.

93. (Original) A cathodoluminescent device as recited in Claim 80, wherein said device is a CRT.

94. (Original) A cathodoluminescent device as recited in Claim 80, wherein said device is a projection CRT.

95. (Original) A cathodoluminescent device as recited in Claim 80, wherein said device is a heads-up display.

96. (Original) A cathodoluminescent device as recited in Claim 80, wherein said device is a heads-down display.

97. (Previously Presented) A cathodoluminescent display device, comprising:

a) an excitation source having an excitation potential of not greater than about 5 kV; and

b) at least a first layer of cathodoluminescent phosphor particles selected from the group consisting of  $Zn_2SiO_4$ ,  $Y_2SiO_5$  and  $SrGa_2S_4$  that are adapted to be stimulated by said excitation source, wherein said phosphor particles have a weight average particle size of from about 0.1  $\mu m$  to about 10  $\mu m$ , a substantially spherical morphology and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

98. (Original) A cathodoluminescent display device as recited in Claim 97, wherein said phosphor particles have a weight average particle size of from about 0.3  $\mu m$  to about 5  $\mu m$ .

99. (Cancelled)

100. (Original) A cathodoluminescent display device as recited in Claim 97, wherein said particles comprise  $Zn_2SiO_4$ , and from about 0.05 to about 2 atomic percent Mn.

101. (Original) A cathodoluminescent device as recited in Claim 97, wherein said particles comprise  $Y_2SiO_5$ , and a dopant selected from the group consisting of Tb and Ce.

102. (Original) A cathodoluminescent device as recited in Claim 97, wherein said particles comprise  $SrGa_2S_4$  and a dopant selected from the group consisting of Eu and Ce.

103. (Original) A cathodoluminescent display device as recited in Claim 97, wherein said device is a field emission display.

104. (Previously Presented) A cathodoluminescent display device, comprising:

a) an excitation source having an excitation potential of at least about 20 kV; and

b) at least a first layer comprising  $Zn_2SiO_4$  cathodoluminescent phosphor particles adapted to be stimulated by said excitation source, wherein said phosphor particles have a weight average particle size of from about 0.1  $\mu m$  to about 10  $\mu m$ , a substantially spherical morphology and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

105. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said phosphor particles have an average size of from about 0.1  $\mu m$  to about 5  $\mu m$ .

106. (Original) A cathodoluminescent display device as recited in Claim 104, wherein at least about 90 weight percent of said particles are not larger than about two times said average particle size.

107. (Cancelled)

108. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said particles comprise  $Zn_3SiO_4$  and from about 0.05 to about 2 atomic percent Mn.

109. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said device is a CRT.

110. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said device is a projection CRT.

111. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said device is a heads-down display.

112. (Original) A cathodoluminescent display device as recited in Claim 104, wherein said device is a heads-up display.

113. (Previously Presented) A field emission display, comprising:

a) a back plate portion comprising a plurality of electron tip emitters; and  
b) a transparent front plate portion comprising a layer of phosphor powder comprising substantially spherical cathodoluminescent phosphor particles selected from the group consisting of  $Y_2SiO_5$  and  $SrGa_2S_4$ , wherein said phosphor particles have a weight average particle size of from about 0.1  $\mu m$  to about 5  $\mu m$  and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than twice said average particle size.

114. (Cancelled)

115. (Cancelled)

116. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles comprise  $Y_2SiO_5$ .

117. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles comprise  $Y_2SiO_5$  and from about 5 to about 20 atomic percent Tb as a dopant.

118. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles comprise  $Y_2SiO_5$  and from about 0.05 to about 5 atomic percent Ce as a dopant.

119. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles comprise  $SrGa_2S_4$  and a dopant selected from the group consisting of Eu and Ce.

120. (Original) A field emission display as recited in Claim 113, wherein at least about 90 weight percent of said particles are not larger than twice said average particle

size.

121. (Cancelled)

122. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles form a pixel layer having an average thickness of not greater than about three times said average particle size.

123. (Original) A field emission display as recited in Claim 113, wherein said phosphor particles are coated phosphor particles comprising a coating substantially encapsulating said particles.

124. (Previously Presented) A CRT display device, comprising:

a) an excitation source comprising an electron emitter; and

b) a transparent front plate portion comprising a layer of phosphor powder comprising substantially spherical cathodoluminescent phosphor particles selected from the group consisting of  $Y_2O_2S$ ,  $ZnS$ ,  $SrGa_2S_4$  and  $Y_2SiO_5$ , wherein said phosphor particles have a weight average particle size of from about  $0.1\text{ }\mu\text{m}$  to about  $5\text{ }\mu\text{m}$  and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than twice said average particle size.

125. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles comprise  $Y_2O_2S$ .

126. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles comprise  $Y_2O_2S$  and a dopant selected from the group consisting of Eu, Tb and combinations thereof.

127. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles comprise  $ZnS$ .

128. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles comprise  $ZnS$  and a dopant selected from the group consisting of Au, Al, Ag, Cl, Cu and combinations thereof.

129. (Cancelled)

130. (Cancelled)

131. (Original) A CRT display device as recited in Claim 124, wherein said

phosphor particles comprise  $\text{SrGa}_2\text{S}_4$ .

132. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles comprise  $\text{SrGa}_2\text{S}_4:\text{Eu}$ .

133. (Original) A CRT display device as recited in Claim 124, wherein said particles comprise  $\text{Y}_2\text{SiO}_5$  and a dopant selected from the group consisting of Tb and Ce.

134. (Cancelled)

135. (Original) A CRT display device as recited in Claim 124, wherein said weight average particle size is from about 0.3  $\mu\text{m}$  to about 3  $\mu\text{m}$ .

136. (Original) A CRT display device as recited in Claim 124, wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

137. (Original) A CRT display device as recited in Claim 124, wherein said phosphor particles form a pixel layer having an average thickness of not greater than about three times said average particle size.

138. (Previously Presented) A projection CRT display device, comprising:

a) a cathodoluminescent excitation source;  
b) a display screen; and  
c) a phosphor layer disposed between said excitation source and said display screen, wherein said phosphor layer comprises substantially spherical cathodoluminescent phosphor particles selected from the group consisting of  $\text{Y}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_2\text{S}$  and  $\text{Zn}_2\text{SiO}_4$ , wherein said phosphor particles have a weight average particle size of from about 0.1  $\mu\text{m}$  to about 5  $\mu\text{m}$  and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than twice said average particle size.

139. (Original) A projection CRT as recited in Claim 138, wherein said phosphor particles comprise  $\text{Y}_2\text{O}_3:\text{Eu}$ .

140. (Original) A projection CRT as recited in Claim 138, wherein said phosphor particles comprise  $\text{Y}_2\text{O}_2\text{S}:\text{Eu}$ .

141. (Original) A projection CRT as recited in Claim 138, wherein said phosphor particles comprise  $\text{Zn}_2\text{SiO}_4$ .

142. (Original) A projection CRT as recited in Claim 138, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

143-211. (Cancelled)

212. (New) A powder batch comprising cathodoluminescent phosphor particles, wherein said particles have a weight average particle size of from about 0.1  $\mu\text{m}$  to about 10  $\mu\text{m}$  and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

213. (New) A powder batch as recited in Claim 212, wherein said particles have a weight average particle size of from about 0.3  $\mu\text{m}$  to about 5  $\mu\text{m}$ .

214. (New) A powder batch as recited in Claim 212, wherein said particles have a weight average particle size of from about 0.3  $\mu\text{m}$  to about 3  $\mu\text{m}$ .

215. (New) A powder batch as recited in Claim 212, wherein said particles comprise  $\text{Y}_2\text{O}_3$ .

216. (New) A powder batch as recited in Claim 215, wherein said particles further comprise Eu.

217. (New) A powder batch as recited in Claim 212, wherein said particles comprise  $\text{Y}_2\text{O}_2\text{S}$ .

218. (New) A powder batch as recited in Claim 217, wherein said particles further comprise a dopant selected from the group consisting of Eu, Tb and combinations thereof.

219. (New) A powder batch as recited in Claim 212, wherein said particles comprise  $\text{ZnS}$ .

220. (New) A powder batch as recited in Claim 219, wherein said particles further comprise a dopant selected from the group consisting of Au, Al, Cu and combinations thereof.

221. (New) A powder batch as recited in Claim 219, wherein said particles further comprise a dopant selected from the group consisting of Ag, Cl and combinations thereof.

222. (New) A powder batch as recited in Claim 212, wherein said particles comprise  $\text{SrGa}_2\text{S}_4$ .

223. (New) A powder batch as recited in Claim 222, wherein said particles further comprise a dopant selected from the group consisting of Eu, Ce and combinations thereof.

224. (New) A powder batch as recited in Claim 212, wherein said particles comprise  $Y_5(Ga,Al)_5O_{12}$ .

225. (New) A powder batch comprising  $Y_2O_3$  phosphor particles, wherein said particles have a weight average particle size of from about  $0.1\ \mu m$  to about  $10\ \mu m$  and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

226. (New) A powder batch as recited in Claim 225, wherein said particles have a weight average particle size of from about  $0.3\ \mu m$  to about  $5\ \mu m$ .

227. (New) A powder batch as recited in Claim 225, wherein at least about 90 weight percent of said particles are not larger than two times said average particle size.

228. (New) A powder batch as recited in Claim 225, wherein said particles comprise Eu as a dopant.

229. (New) A powder batch as recited in Claim 225, wherein said particles comprise from about 4 to about 6 atomic percent Eu as a dopant.

230. (New) A powder batch as recited in Claim 225, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

231. (New) A powder batch comprising  $Y_2SiO_5$  phosphor particles, wherein said particles have an average size of from about  $0.1\ \mu m$  to about  $10\ \mu m$  and wherein said particles have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

232. (New) A powder batch as recited in Claim 231, wherein said particles have a weight average particle size of from about  $0.3\ \mu m$  to about  $5\ \mu m$ .

233. (New) A powder batch as recited in Claim 231, wherein at least about 90 weight percent of said particles are not larger than two times said average particle size.

234. (New) A powder batch as recited in Claim 231, wherein said particles comprise a dopant selected from the group consisting of Tb and Ce.

235. (New) A powder batch as recited in Claim 231, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.